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Study of performance of 120 freshmen from upper quartile of high school graduating class. Major emphasis of study was to determine if size of high school has any bearing upon progress in college. Students from high schools having 50 or more in senior classes did better academically than those from smaller high schools. Findings take cognizance of fact that sampling was small and that the study covered only one-fourth of the students' college performance.

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A STUDY OF THE PERFORMANCE OF UPPER QUARTILE STUDENTS AS FRESHMEN IN THE STATE UNIVERSITY OF SOUTH DAKOTA

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

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OFFICE OF
STUDENT GUIDANCE AND COUNSELING
R. H. KNAPP, DIRECTOR

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PURPOSE OF THE STUDY

What happens to the student in college who comes from the upper quartile in his graduating class? Does size of high school have any bearing upon his progress in college? Does his progress vary in college according to the general areas of academic activity--namely, mathematics-science, language arts, social studies, and fine arts? How does he compare with other students as to scores earned on the School and College Ability Test (SCAT)? Answers to these and other questions were sought in this brief study of students entering the State University of South Dakota as freshmen in September, 1957.

This is a group study. Conclusions concerning individual students cannot be drawn from the data presented.

PROCEDURE

The study revolves around 120 students who entered as freshmen in September, 1957, and who completed the first year. All students were ranked in the upper one-fourth of their graduating classes. SCAT scores and freshman grades were available on all students as well.

The students were placed in four groups according to the size of their high school graduating classes. Group I included those students graduating from classes that contained from 1 to 24 students, inclusive; Group II, 25 to 49, inclusive; Group III, 50 to 74, inclusive; and, Group IV, 75 or more. The schools included in each group and from which students originated are as follows:

Group I

Alvord, Iowa
Bancroft, Nebraska
Battle Creek, Iowa
Bonesteel, South Dakota
Canistota, South Dakota
Elkton, South Dakota
Elk Point, South Dakota
Frederick, South Dakota
Hartford, South Dakota
Hosmer, South Dakota
Irene, South Dakota
Jefferson, South Dakota
Larchwood, Iowa
Meadow Grove, Nebraska
Meckling, South Dakota
Pocahontas, Iowa
Ruthven, Iowa
Sioux Rapids, Iowa
Tripp, South Dakota
Wakonda, South Dakota
White Lake, South Dakota
Woonsocket, South Dakota

Group II

Arlington, South Dakota
Avon, South Dakota
Bridgewater, South Dakota
Browns Valley, Minnesota
Centerville, South Dakota
Custer, South Dakota
Deadwood, South Dakota
Freeman, South Dakota
Gettysburg, South Dakota
Howard, South Dakota
Kimball, South Dakota
Lemmon, South Dakota
Milford, Iowa
Mobridge, South Dakota
Murdo, South Dakota
Notre Dame, Mitchell, South Dakota
Pine Ridge, South Dakota
Ponca, Nebraska
Rock Rapids, Iowa
Sibley, Iowa
Spearfish, South Dakota

Group III

Canton, South Dakota
Fort Pierre, South Dakota
Gregory, South Dakota
Manning, Iowa
Milbank, South Dakota
Redfield, South Dakota
Sac City, Iowa
South Sioux City, Nebraska
Spirit Lake, Iowa
Tyndall, South Dakota
Vermillion, South Dakota

Group IV

Cherokee, Iowa
Denison, Iowa
Huron, South Dakota
Kenosha, Wisconsin
LeMars, Iowa
Milwaukee Messmer, Wisconsin
Mitchell, South Dakota
Rapid City, South Dakota
Sioux City Central, Iowa
Sioux City East, Iowa
Sioux City Heelan, Iowa
Sioux Falls, South Dakota
Sisseton, South Dakota
Spencer, Iowa
Springfield, Pennsylvania
Storm Lake, Iowa
Sturgis, South Dakota
Watertown, South Dakota
Yankton, South Dakota

NUMBER OF STUDENTS IN EACH GROUP

numbers of students in each of the four groups of students are fairly even: Group I - 30 students; Group II - 28 students; Group III - 25 students; and, Group IV - 37 students. The total group of 120 students contained 70 girls and 50 boys. Since the original freshman class contained a ratio of about 3 boys to one girl, it is interesting to find about half again as many girls as boys made up this group of upper quartile students. This bears out again the fact that apparently girls do better than boys when it comes to "hitting the books."

DATA GATHERED ON EACH STUDENT

The following information was gathered on each of the 120 students and is summarized in this study.

1. Name
2. Sex
3. Rank in high school class - name of high school
4. Drop-outs at end of first year
5. Raw scores of Q, V, and T (SCAT)
6. Percentile Ranks of Q, V, and T (SCAT)
7. Hours carried school year 1857-58 (Sept. to June)
8. Hours earned (same)
9. Hours failed (same)
10. Grade Points earned school year 1957-58
11. Average (same)
12. Hours earned Math-Science
13. Hours failed Math-Science
14. Grade points Math-Science
15. Average Math-Science
16. Hours earned Language Arts
17. Hours failed Language Arts
18. Grade points Language Arts
19. Average Language Arts
20. Hours earned Social Science
21. Hours failed Social Science
22. Grade Points Social Science
23. Average Social Science
24. Hours earned Fine Arts
25. Hours failed Fine Arts
26. Grade points Fine Arts
27. Average Fine Arts

HOW SUBJECTS WERE GROUPED IN ACADEMIC AREAS

The courses carried by tudents were grouped in four general academic areas. This was done in order to compare the progress of students from various sized high schools in the general areas of university work. The listings are as follows:

Area I
Math-Science

Mathematics courses
Science courses (physical and biological)
Applied Science courses

Area 2
Language Arts

English courses
Foreign Language courses
Speech courses
Journalism courses

Area 3
Social Science

History courses
Government courses
Psychology courses
Sociology courses
Economics courses
Education courses
Secretarial Training courses

Area 4
Fine Arts

Music courses
Dramatic Arts courses
Art courses
Band

Figure 1

NUMBERS OF STUDENTS, ABILITY SCORES, AND ACHIEVEMENT RECORD WITH TOTAL GRADE POINT AVERAGES FOR EACH OF THE FOUR GROUPS

Group	Number of Students			Mean Scores on SCAT (Raw)			Total Hours			Grade Points	
	Male	Female	Total	Q	V	T	Passed	Failed	Carried	Earned	Average
I	16	14	30	38.00	33.88	71.86	915	32	947	2449	2.586
II	10	18	28	35.78	33.60	69.38	863	9	872	2256	2.587
III	12	13	25	38.68	33.92	72.60	789	4	793	2303	2.904
IV	12	25	37	38.21	38.78	76.99	1140	12	1152	3392	2.944

Figure I reveals some interesting facts about the 120 students studied. The distribution of the number of students by se: 'n the four groups is shown. Seventy women and fifty men were included in the study.

In analyzing SCAT data, which reflects scholastic aptitude, raw scores were used rather than converted or percentile scores. Converted or percentile scores do not lend themselves to averaging. Only when we examine the scores for Group IV, those coming from schools where the senior class contained more than 75 members, do we find significant differences and then only in the verbal or linguistic score and the total score. Students coming from the larger schools seem to be stronger in language usage and in general scholastic ability. It should be noted that the ability to think with quantitative symbols (Q) is about the same for all four groups, in fact, the Q scores for groups I and IV are almost identical.

Percentile norms for groups are not available but if we were to convert the raw scores into percentile equivalents by using individual student norm tables we would find that the raw total score on Group I would yield a percentile equivalent of 63. The raw total score for Group II - 57; the raw total score for Group III - 63; and, the raw total score for Group IV - 73. Again, it would seem that we would get a stronger student from the larger schools than normally come from smaller schools when group averages are considered.

Several interesting facts are brought to light in Figure 2. There does not seem to be any relationship between size of high school and achievements in the Fine Arts. It is noticeable, too, that there were no failures among all of the groups in Fine Arts for the time reported. In general, it would seem that grades earned in the Fine Arts averaged about one grade higher than in other areas—there are exceptions of course.

Figure 2

ACHIEVEMENT OF THE GROUPS IN THE GENERAL ACADEMIC AREAS

Group	MATH-SCIENCE					LANGUAGE ARTS					SOCIAL STUDIES					FINE ARTS				
	Carried	Passed	Failed	Grade Points	Average	Carried	Passed	Failed	Grade Points	Average	Carried	Passed	Failed	Grade Points	Average	Carried	Passed	Failed	Grade Points	Average
I	*305	285	20	769	2.521	334	330	4	886	2.652	207	201	6	521	2.516	37	37	0	127	3.432
II	282	274	8	713	2.528	332	332	0	939	2.828	177	177	0	412	2.327	21	21	0	69	3.286
III	247	243	4	649	2.627	312	312	0	970	3.108	131	131	0	363	2.771	36	36	0	135	3.750
IV	342	334	8	982	2.871	416	412	4	1228	2.951	236	236	0	680	2.881	79	79	0	280	3.544
ALL	1176	1136	40	3113	2.647	1394	1386	8	4023	2.886	751	745	6	1976	2.631	173	173	0	611	3.532

* The numbers under the columns carried, passed, and failed, for each of the areas refer to total semester hours for wwhich the group was enrolled.

The total hours failed in the math-science area for Group I, those coming from the smallest high schools, equaled failures in the other three groups of students. Please note, also, that the number of hours failed in the math-science area was several times greater than in the other three academic areas.

In general, it would appear that the academic progress of students in Groups III and IV was consistently better than in Groups I and II.

Figure 3 shows the relationship between grades earned in the University and SCAT scores for the total group. There is, of course, a high degree of relationship between the two sets of data. Ninety-seven of the 120 students earned grade point averages of 2.5 or better. However, it might be significant, too, that 33 of the group earned averages of C or less. Thirty-seven of the group had percentiles less than 50 on SCAT. Of this particular group, 18 earned grade point averages of 2.5 or better or in other words averages of A or B. Three high-ranking students with percentiles above 80 on SCAT earned grade point averages of 2.4 or less.

Figures 4, 5, 6, and 7 are scattergrams which show the relationships between grade point averages and total SCAT scores for the four groups which were formed according to size of graduating class. Each should be studied separately and then compared to the other groupings and then finally to the scattergram for the total group which appears in Figure 3.

In Figure 4, which depicts Group I, 17 or over one-half of the group earned grade point averages of 2.5 or better. Eleven of the group of 20 had percentile scores under 50 on SCAT. The figure points out those that might be called over-achievers and under-achievers. There are at least nine of this group who are not achieving what normally would be expected of them.

Figure 3

A SCATTERGRAM SHOWING THE RELATIONSHIPS BETWEEN
GRADE-POINT AVERAGES AND TOTAL SCAT SCORES
ARRANGED BY DECILES FOR TOTAL GROUP

DECILE RANKINGS ON TOTAL SCAT SCORES

GRADE POINT AVERAGES	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
A 3.5-4.0					1	1	2	3	6	6	19
B 3.0-3.4			1	1	2	4	4	6	5	5	28
2.5-2.9		2	2	3	6	5	8	7	4	3	40
C 2.0-2.4	1	2	2	1	4	2	4	1	1	1	19
1.5-1.9		1	1		6	2	1	1		1	13
D 1.0-1.4							1				1
0.5-0.9											0
F 0.0-0.4											0
Total	1	5	6	5	19	14	20	18	16	16	120

Figure 4

A SCATTERGRAM SHOWING THE RELATIONSHIPS BETWEEN GRADE-POINT AVERAGES AND TOTAL SCAT SCORES FOR GROUP I - (SENIOR CLASS SIZE - 1 TO 24)

DECILE RANKINGS ON TOTAL SCAT SCORES

GRADE POINT AVERAGES	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
A 3.5-4.0								1	3		4
B 3.0-3.4					1		1	1	1	1	5
2.5-2.9		1		1	1	1	1	1	1	1	8
C 2.0-2.4		1			2	1					4
1.5-1.9					4	1	1	1		1	8
D 1.0-1.4							1				1
0.5-0.9											0
F 0.0-0.4											0
Total	0	2	0	1	8	3	4	4	5	3	30

Figure 5

A SCATTERGRAM SHOWING THE RELATIONSHIPS BETWEEN
GRADE POINT AVERAGES AND TOTAL SCAT SCORES
FOR GROUP II - (SENIOR CLASS SIZE - 25 TO 49)

DECILE RANKINGS ON TOTAL SCAT SCORES

GRADE POINT AVERAGES	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
A 3.5-4.0								1		1	2
B 3.0-3.4				1		2	1	1	1		6
2.5-2.9			1	1			5	4		1	12
C 2.0-2.4	1	1					2				4
1.5-1.9		1	1		1	1					4
D 1.0-1.4											0
0.5-0.9											0
F 0.0-0.4											0
Total	1	2	2	2	1	3	8	6	1	2	28

Figure 6

A SCATTERGRAM SHOWING THE RELATIONSHIPS BETWEEN
GRADE POINT AVERAGES AND TOTAL SCAT SCORES
FOR GROUP III - (SENIOR CLASS SIZE - 50 TO 74)

DECILE RANKINGS ON TOTAL SCAT SCORES

GRADE POINT AVERAGES	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
A 3.5-4.0						1	1			3	5
B 3.0-3.4			I			2	2		2		7
2.5-2.9				2	2	1			2		7
C 2.0-2.4			1		1	1	2	1			6
1.5-1.9											0
D 1.0-1.4											0
0.5-0.9											0
F 0.0-0.4											0
Total			2	2	3	5	5	1	4	3	25

Figure 7

A SCATTERGRAM SHOWING THE RELATIONSHIPS BETWEEN
GRADE POINT AVERAGES AND TOTAL SCAT SCORES
FOR GROUP IV - (SENIOR CLASS SIZE - 75 OR MORE)

DECILE RANKINGS ON TOTAL SCAT SCORES

GRADE POINT AVERAGES	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
A 3.5-4.0					1		1	1	3	2	8
B 3.0-3.4					1			4	1	4	10
2.5-2.9		1	1		3	3	2	2	1	1	14
C 2.0-2.4			1		1				1	1	4
1.5-1.9					1						1
D 1.0-1.4											0
0.5-0.9											0
F 0.0-0.4											0
Total		1	2		7	3	3	7	6	8	37

Figure 5 presents the scattergram showing the relationships between grade point averages and SCAT scores for Group II, those who come from high schools whose senior class membership fell between 25 and 49.

It is interesting to note that 8 of the group fell below the 50th percentile on SCAT. It is significant, too, to note that 20 of the 28 received grade point averages of 2.5 or better. Almost one-third of the group had averages of 2.4 or less. There are fewer under-achievers (high aptitude scores and low achievement) in this group than appears in Group I.

Figure 6 presents a scattergram showing the relationships between grade point averages and SCAT scores for Group III, those whose graduating classes fell between 50 and 74 in size.

It is significant to note that all in this group achieved averages of 2.0 or better. There are a number of over-achievers in this group in that about one-half of the members of the group are doing better than normally would be expected of them.

Figure 7 presents a scattergram showing the relationships between grade point averages and total SCAT scores for Group IV, those whose graduating classes contained 75 or more pupils. Thirty-six of this group, in fact, all but one, attained averages of not less that 2.0 and almost half of them had averages of 3.0 or better. The numbers of over-achievers and under-achievers are about even for the group.

CONCLUSION

It would appear that upper quartile students coming from high schools having 50 or more in their senior classes do better, in general, academically here at the State University of South Dakota than do students coming from smaller high schools. Thirteen students out of 58 in Groups I and II failed to maintain a 2.0 average whereas only 1 student out of 62 in Groups III and IV failed to maintain a 2.0 average for the freshman year.

This study does not attempt to assess reasons. Several may be in the picture. Perhaps smaller schools grade higher than do larger schools thus negating somewhat the value of standing in class. It is possible that students coming from smaller schools need more time to adjust to the University situation whereas adjustment to larger group situations has already been learned by graduates of larger schools. Another factor which could be in the picture would be the quality of teaching and the acquisition of study skills and habits by larger school graduates which may be slighted in the smaller schools.

It is recognized that the sampling is small and that it covers only one-fourth of the student's stay in college. Perhaps, a study at the end of four years of college life might present a different picture.